

## **REMARKS**

This paper is submitted in reply to the Office Action dated December 20, 2006, within the three-month period for response. Reconsideration and allowance of all pending claims are respectfully requested.

In the subject Office Action, claims 3-15 were withdrawn from consideration, claim 19 was rejected under 35 U.S.C. § 101, and claims 1 and 2 were rejected under 35 U.S.C. § 112 second paragraph. Moreover, claim 1 was rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 6,556,990 to Lane. Additionally, claims 2, 17 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lane in view of U.S. Patent No. 6,785,677 to Fritchman, and claim 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Lane and Fritchman, and further in view of U.S. Patent No. 5,845,276 to Emerson et al.

Applicants respectfully traverse the Examiner's rejections to the extent that they are maintained. Applicants have amended claim 19, and Applicants respectfully submit that no new matter is being added by the above amendments, as the amendments are fully supported in the specification, drawings and claims as originally filed.

Now turning to the subject Office Action, and initially to the Examiner's withdrawal of claims 3-15, Applicants note that claim 1 is generic to claims 3-15, and as such, Applicants assume that these claims will be considered and restored upon allowance of claim 1. As such, Applicants have declined to cancel these claims herein.

Next, turning to the § 101 rejection of claim 19, the Examiner will note that Applicants have amended claim 19 to clarify that a computer readable storage medium stores the program code as suggested by the Examiner. As the Examiner has admitted that a computer readable storage medium is a "physical article or object", claim 19 now recites admitted statutory subject matter. The Examiner further asserts that "program code" is not statutory; however, it is Applicants understanding that it is the statutory nature of a claim as a whole that is relevant to §101, and the recitation of a computer readable storage medium therefore renders the entire claim statutory. Withdrawal of the §101 rejection is therefore respectfully requested.

Next, turning to the §112, second paragraph rejection of claims 1 and 2, the Examiner has argued that the term "index over the column" is unclear. However, the term is used numerous times in the specification, and a search of other U.S. Patents containing the term "index over" combined with "database" finds 122 issued U.S. Patents incorporating the same term. As one of ordinary skill in the art will appreciate, creating an index "over" a column means to create an index for a column, or an index that describes at least a portion of the contents of a column. The Examiner's attention is respectfully directed to page 3, lines 1-17 of the Application for a more detailed discussion of indices and in particular indices "over" columns. Accordingly, Applicants submit that this term is not unclear, and withdrawal of the §112 rejection is therefore respectfully requested.

Now turning to the art-based rejection, and specifically to the rejection of independent claim 1, this claim recites a method for indexing a database table. The table comprises a column of values, and the method comprises identifying a plurality of substrings, each substring comprising one or more characters, and for each substring creating a corresponding index over the column, wherein each corresponding index includes a respective entry for each value in the column, the respective entry for a particular value being indicative of whether a corresponding substring occurs in the particular value.

As such, claim 1 recites, in part, the concept of generating a plurality of indices over the same column. Each of these indices is created for and corresponds to a particular substring among a plurality of substrings, with each index having an entry for each value in the column that indicates whether the corresponding substring is found in that value.

Fig. 4A of the Application, for example, illustrates a set of indices 405, 407, 409, with each index corresponding to a particular ASCII character, and with each entry in the index specifying with a "1" or "0" whether the corresponding ASCII character is found in the associated value in the "Field2" column 402 of a table 400 (*see also* page 12, line 15 to page 13, line 2 of the specification).

Lane, the referenced cited by the Examiner, does not disclose a plurality of indices over a column, where each index corresponds to a particular substring among a plurality

of substrings. Instead, Lane discloses two separate embodiments of data structures that may be used to locate substrings in a table.

The first embodiment, shown in Fig. 3 and described at col. 4, line 65 to col. 5, line 10, relies on a single "sub-string index" labeled 305. The sub-string index has a first column with identifiers of rows in the table, and a second column with sub-strings associated with the strings in the rows in the table. Thus, as can be seen in Fig. 3, index 305 includes three entries mapping Row 001 of the table (which contains the string "ABCDE") to three sub-strings "ABC", "BCD", and "CDE".

Consequently, this embodiment discloses a single index. Furthermore, this single index includes entries that correspond to multiple, different substrings. Claim 1, on the other hand, recites a plurality of indices, with each index corresponding to a particular substring. It should be noted that claim 1 specifically recites "for each substring creating a corresponding index over the column," which means that, given a "plurality" of substrings are identified, a plurality of indices are created over the same column. Claim 1 also recites "each corresponding index", which likewise presumes that multiple indices are created.

The first embodiment disclosed in Lane therefore does not disclose "for each substring creating a corresponding index over the column, wherein each corresponding index includes a respective entry for each value in the column, the respective entry for a particular value being indicative of whether a corresponding substring occurs in the particular value," as required by claim 1.

The second embodiment of Lane, also shown in Fig. 3, and described at col. 5, lines 11-33, relies upon a "sub-string table" labeled 308, which includes a first column with strings from the target column of the table and a second column with sub-strings associated with the strings in the first column. Thus, as may be seen in Fig. 3, three rows are provided in the sub-string table for the string "ABCDE", with each row mapping the string to a different sub-string, here "ABC", "BCD", and "CDE".

Two points are worth mentioning with respect to sub-string table 308. First, the sub-string table is identified by Lane as "table" and not an "index." Thus, the sub-string table 308 cannot be interpreted as one of a plurality of indices within the context of claim

1. Second, sub-string index 305 and sub-string table 308 are described as being from alternative embodiments, i.e., they are never used together in the same embodiment, as they are alternative ways of performing the same function.

In addition, even if table 308 were analogized to an index, it would still fail to anticipate the indices recited in claim 1. As with index 305, table 308 discloses a single data structure. Furthermore, this single data structure includes entries that correspond to multiple, different substrings. Claim 1, on the other hand, recites a plurality of indices, with each index corresponding to a particular substring.

The second embodiment illustrated in Fig. 3 also includes two indices 306 and 310. Index 306 is created on the target column of the primary table, as is used to map strings in the target column to row identifiers in the table. Thus, for string "ABCDE", index 306 includes an entry identifying row 001 as containing that string.

Index 310, on the other hand, is created on the sub-string column of sub-string table 308 to map each sub-string in sub-string table 308 to rows in the sub-string table 308. Consequently, for sub-string "CDE", index 310 includes an entry mapping that sub-string to row 002 of sub-string table 308. Thus, to identify rows in the primary table that contain the substring "CDE", Lane first accesses index 310 to locate an entry matching the substring, and when such an entry is found, uses the row number identified in the entry to access the corresponding row in the sub-string table 308. The identified row of sub-string table 308 is then used to locate the complete string "ABCDE" containing the substring, and index 306 is accessed to locate the row number in the primary table that contains the complete string.

Of note, however, as with both index 305 of the first embodiment, and table 308 of the second embodiment, each of indices 306, 310 fails to meet the language recited in claim 1. Each index 306, 310 is a single index. Furthermore, index 306 does not even contain substrings, but rather contains complete strings from the primary table. Index 310, while containing substrings, contains multiple substrings, and thus does not "correspond" to a particular substring.

In addition, even were all of the indices and tables in the second embodiment collectively considered to represent a set of indices, no individual indices correspond to

specific substrings. Consequently, the second embodiment does not disclose "for each substring creating a corresponding index over the column, wherein each corresponding index includes a respective entry for each value in the column, the respective entry for a particular value being indicative of whether a corresponding substring occurs in the particular value," as required by claim 1.

Applicants therefore respectfully submit that claim 1 is novel over Lane, and the rejection should be withdrawn.

Applicants also respectfully submit that claim 1 is non-obvious over Lane, as no objective evidence has been provided establishing that one of ordinary skill in the art would be motivated to modify Lane to incorporate the substring-specific indices recited in claim 1. Certainly Lane, which discloses two different sets of data structures for locating substrings in a table, neither of which meet the language of claim 1, does not provide any such motivation. Applicants therefore respectfully submit that independent claim 1 is patentable over Lane and the other prior art of record. Reconsideration and allowance of claim 1, and of claim 2 which depends therefrom, are respectfully requested. Furthermore, claims 3-15, which depend from claim 1, are also patentable based upon their dependency on claim 1.

Next, with respect to independent claims 17 and 19, each of these claims similarly recites in part the concept of a plurality of substring-specific indices. Claim 17 recites a plurality of indices, with each index corresponding to one of a plurality of substrings and including a respective entry for each value in a column, where the respective entry in each index is indicative of whether a corresponding substring to which such index corresponds occurs within the value for which the respective entry is included. Claim 19 recites creating a corresponding index over a column for each of a plurality of substrings, where each corresponding index includes a respective entry for each value in the column, and where the respective entry for a particular value is indicative of whether a corresponding substring occurs in the particular value.

As discussed above in connection with claim 1, Lane does not disclose or suggest the claimed substring-specific indices. Furthermore, the secondary reference cited by the Examiner, Fritchman, is relied upon merely for allegedly disclosing "a number of

occurrences." Fritchman does not disclose any data structure analogous a substring-specific index, so Fritchman fails to remedy the shortcomings of Lane.

Furthermore, with respect to the "number of occurrences," it appears the Examiner has done little more than a crude text search for the word "occurrence", as the cited passage at col. 7, lines 30-35, discusses a "preprocessing phase" where a pattern in a query is partitioned into segments delimited by interspersed wildcards. The word "occurrence" in the passage has nothing whatsoever to do with tracking a number of occurrences of a substring, much less storing any particular number in an index entry. The passage is thus completely irrelevant to either of claim 17 or 19.

Applicants therefore respectfully submit that independent claims 17 and 19 are novel and non-obvious over Lane and Fritchman and the other art of record. Reconsideration and allowance of claims 17 and 19, and of claim 18 which depends therefrom, are therefore respectfully requested.

In summary, Applicants respectfully submit that all pending claims are novel and non-obvious over the prior art of record. Reconsideration and allowance of all pending claims are therefore respectfully requested. If the Examiner has any questions regarding the foregoing, or which might otherwise further this case onto allowance, the Examiner may contact the undersigned at (513) 241-2324. Moreover, if any other charges or credits are necessary to complete this communication, please apply them to Deposit Account 23-3000.

Respectfully submitted,

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Date

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